

CLAIMS:

1. A miter saw comprising:

a base assembly defining a cutting zone and configured to support workpieces in the

5 cutting zone;

a pivot arm coupled to the base assembly and selectively moveable toward and away
from the cutting zone;

a motor assembly;

a rotatable arbor supported by the pivot arm and driven by the motor assembly;

10 a rotatable blade mounted on the arbor and configured to cut workpieces supported
within the cutting zone;

a detection system configured to detect one or more dangerous conditions between a
person and the blade; and

15 a reaction system configured to stop movement of the pivot arm toward the base
assembly upon detection by the detection system of the one or more dangerous conditions.

2. The miter saw of claim 1, further comprising a rotatable platen adjacent the base
assembly.

3. The miter saw of claim 1, where the reaction system is configured so that the pivot arm moves no more than one-eighth of an inch toward the base assembly after the detection system detects the one or more dangerous conditions.

5

4. The miter saw of claim 1, where the reaction system is configured to stop the movement of the pivot arm toward the base assembly within 10 milliseconds.

5. The miter saw of claim 1, further comprising a tilt mechanism between the base assembly and the pivot arm, where the tilt mechanism is configured so that the pivot arm may tilt relative to the base assembly.

6. The miter saw of claim 5, where the reaction system comprises a brace member and a locking assembly; where the brace member is coupled to the tilt mechanism and the locking assembly; where the locking assembly is coupled to the pivot arm; and where the locking assembly is configured to lock onto the brace member to prevent the pivot arm from moving toward the base assembly when the detection system detects the one or more dangerous conditions between a person and the blade.

20

7. The miter saw of claim 6, where the reaction system further comprises a positioning mechanism associated with the brace member and locking assembly and configured to reduce any play in the brace member and locking assembly.

5

8. The miter saw of claim 7, where the positioning mechanism comprises a spring.

9. The miter saw of claim 6, where the brace member is slidably coupled to the locking assembly, and where the locking assembly comprises a gripping mechanism configured to selectively engage and grip the brace member.

10. The miter saw of claim 9, where the gripping mechanism comprises a clamping device; and where the locking assembly further comprises a biasing mechanism configured to urge the clamping device to a locked position, and a restraining mechanism configured to maintain the clamping device in a nominal position until the detection system detects the one or more dangerous conditions.

11. The miter saw of claim 10, where the restraining mechanism comprises a fusible member.

5 12. The miter saw of claim 1, where the reaction system comprises a brace member
and a locking assembly; where the brace member is coupled to the base assembly and the locking
assembly; where the locking assembly is coupled to the pivot arm; and where the locking
assembly is configured to lock onto the brace member to prevent the pivot arm from moving
toward the base assembly when the detection system detects the one or more dangerous
conditions between a person and the blade.
10

13. The miter saw of claim 12, where the brace member is slidably coupled to the locking assembly, and where the locking assembly comprises a gripping mechanism configured to selectively engage and grip the brace member.

14. The miter saw of claim 13, where the gripping mechanism comprises a clamping device; and where the locking assembly further comprises a biasing mechanism configured to urge the clamping device to a locked position, and a restraining mechanism configured to maintain the clamping device in a nominal position until the detection system detects the one or more dangerous conditions.

15. The miter saw of claim 14, where the restraining mechanism comprises a fusible member.

5 16. The miter saw of claim 1, where the reaction system is further configured to stop the rotation of the blade upon detection by the detection system of the one or more dangerous conditions.

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32

17. A miter saw comprising:

a base assembly defining a cutting zone and configured to support workpieces in the cutting zone;

at least one rail extending outward from the base assembly;

5 a pivot arm slidably mounted on the at least one rail, where the pivot arm is configured to pivot downwardly toward the base assembly and to slide on the at least one rail toward the base assembly;

a motor assembly;

a rotatable arbor supported by the pivot arm and driven by the motor assembly;

10 a rotatable blade mounted on the arbor and configured to cut workpieces supported within the cutting zone;

a detection system configured to detect one or more dangerous conditions between a person and the blade; and

15 a reaction system configured to stop the pivoting and sliding of the pivot arm toward the base assembly upon detection by the detection system of the one or more dangerous conditions.

10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

18. A miter saw comprising:

a base assembly defining a cutting zone and configured to support workpieces in the

cutting zone;

a pivot arm coupled to the base assembly and selectively moveable toward and away

5 from the cutting zone;

a motor assembly;

a rotatable arbor supported by the pivot arm and driven by the motor assembly;

a rotatable blade mounted on the arbor and configured to cut workpieces supported
within the cutting zone;

40 a detection system configured to detect one or more dangerous conditions between a
person and the blade; and

reaction means for stopping movement of the pivot arm toward the base assembly upon
detection by the detection system of the one or more dangerous conditions.